

muRata

INNOVATOR IN ELECTRONICS

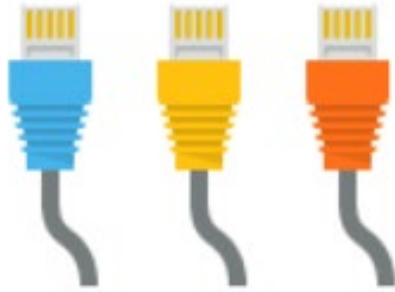
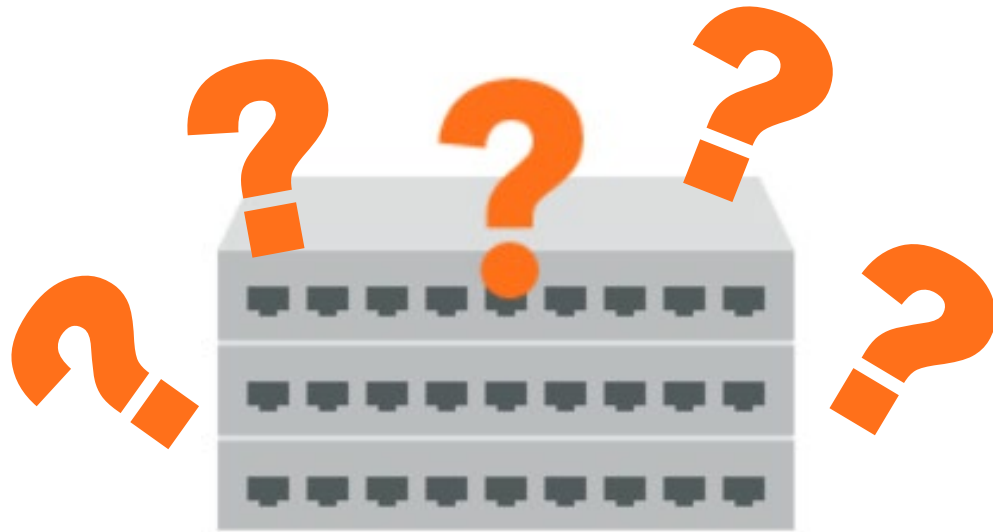
Is it worth the risk?

Don't Put Your Life on the Lines

Cable Authentication with RFID

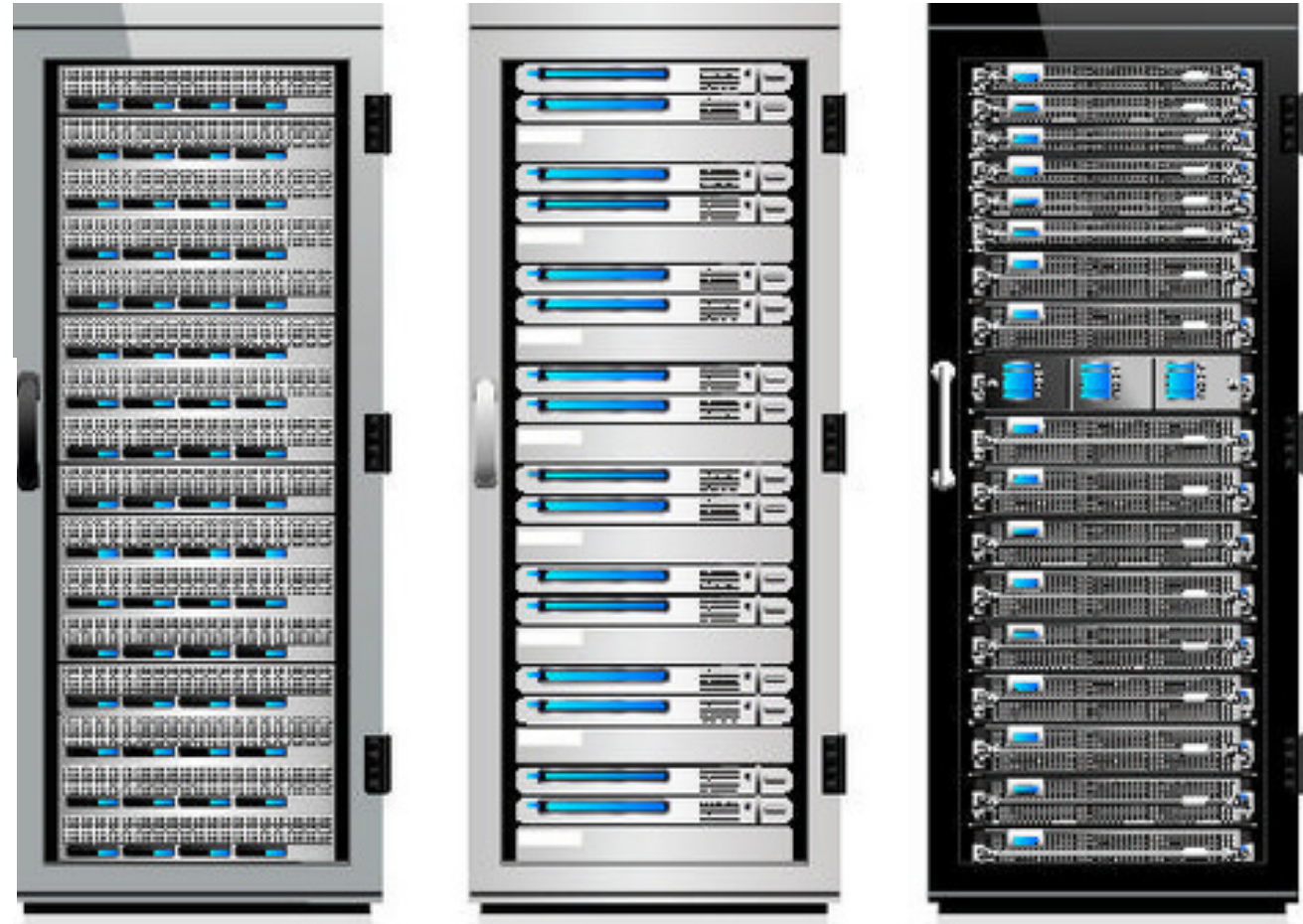


Challenges in Cable Management [Data Centre Servers]



H-E-L-P!!! Wiring is too difficult and time consuming!
How can I insert the right cable into the right port effortlessly?

[Servers in Data Centres]



Other examples of common challenges...



Problem

- Human errors resulting in maintenance downtime
- Inefficient tracking of product lifecycle management

A

Downtime: Misfeed – leading to system stoppage. Significant costs incurred.



B

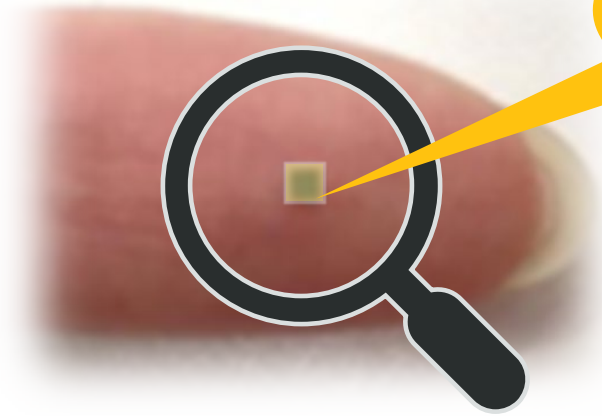
Inefficiencies: Hand-written or manual input. Slow and tedious process, unproductive.



Proposed Solution/s with Murata RFID Technology

Introducing...

**Murata's ultra small & robust
passive RFID micro tag;
Embeddable in cable**



Compact in size
yet powerful!

1.25 x 1.25mm

**Enabling SMART
Cable Connection**

Innovation towards Smart Cable Connector

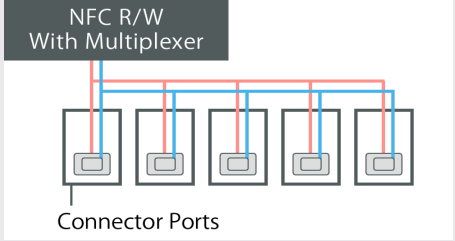
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Murata
RFID micro tag

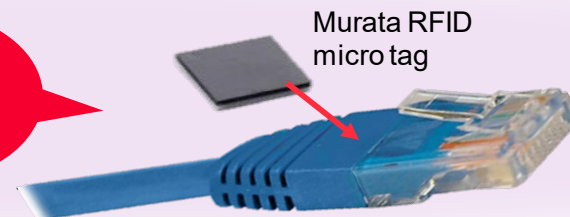
- ✓ Verify accurate connections
- ✓ Improve efficiency in cable management
- ✓ Prevent human error

Proposed Solutions

	<u>Solution #1</u>	<u>Solution #2</u>	<u>Solution #3</u>
Reading method	Handheld - R/W	Single NFC Chip Tag & Antenna on board	
RFID R/W Antenna	Integrated in reader	Single Antenna	Multiple Antennas
Development required	No	Yes	Yes
Way of detection	 • Easy to implement • Economical, short term solution	 • “Touch & Go” scanning method	 • Integrate reader writer and small antennas into server ports

Murata RFID micro tag is a compact tag that is easy to read and robust to harsh environments.

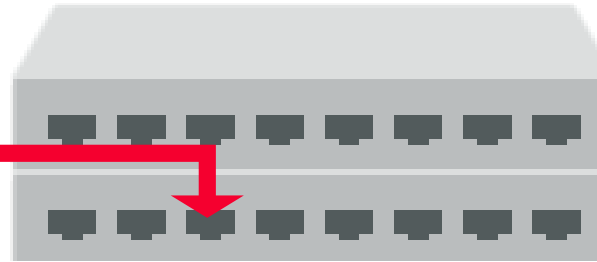
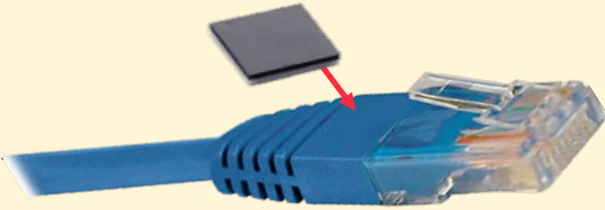
**Small
and
robust**



Murata supports seamless communication with our RFID technology.

Solution #1: Detect by Handheld – R/W

Murata RFID micro tag



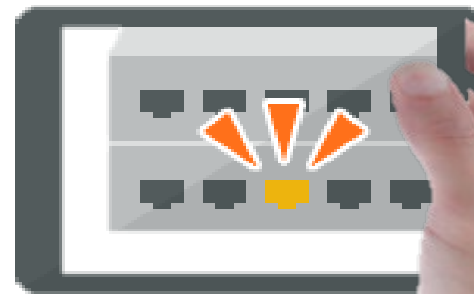
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**Handheld-reader
detects cable with RFID**



**Directs users to the right
port for connection**

**Register master data
through PC/ tablet**



1. Detect by Handheld – R/W

**2. Detect by NFC chip R/W & Antenna on board
(Single Antenna & Reader)**

**3. Detect by NFC chip R/W & Antenna on board
(Multiple Antennas & Single Reader)**

Solution #2: Detect by NFC Chip & Antenna on board

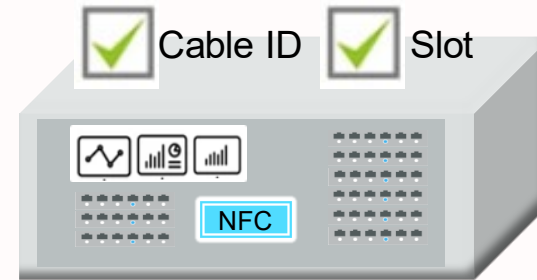
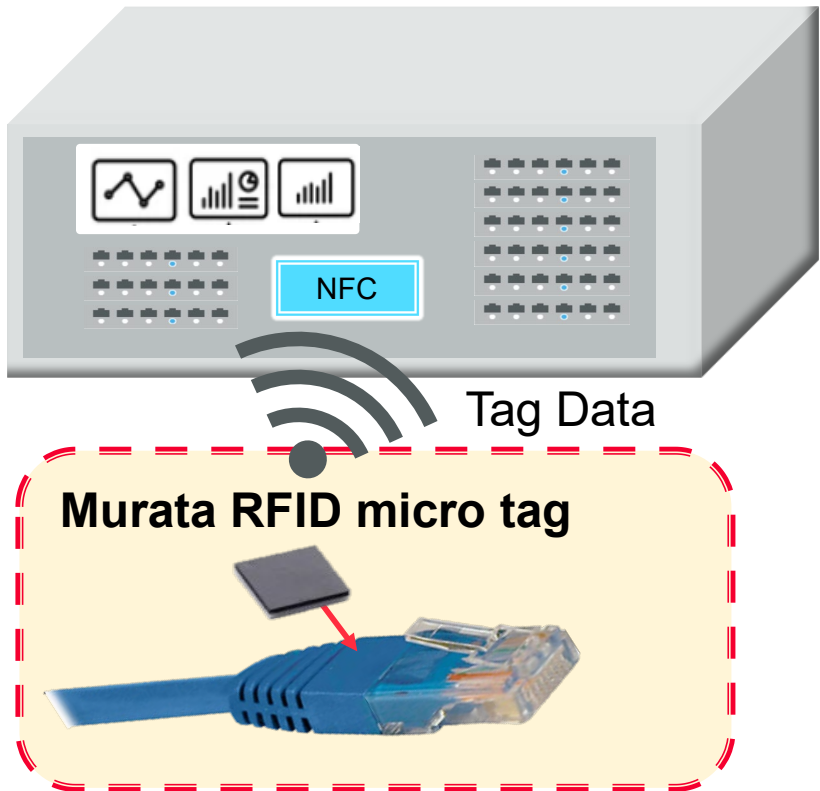
(Single Antenna & Reader)



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- Development required to integrate server with NXP RFID reader/ writer chip and display.
- During installation or repair, NXP RFID reader/ writer to detect each tag's unique identification number.



- The NFC chip can recognize the cable's ID fast and accurately, validating the exact port location.
- It is possible to leave a record of insertion or removal with integrated reader/ writer.

1. Detect by Handheld – R/W

2. Detect by NFC chip R/W & Antenna on board
(Single Antenna & Reader)

3. Detect by NFC chip R/W & Antenna on board
(Multiple Antennas & Single Reader)

Solution #3: Detect by NFC Chip & Antenna on board (Multiple Antennas & Single Reader)

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The concept of a single RFID reader using multiple antennas to detect multiple RFID micro tags



RFID controller board

Option 1

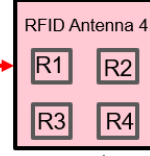
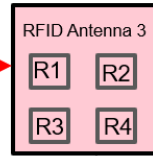
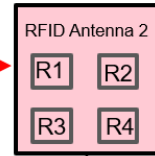
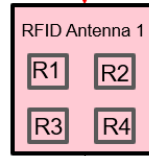
NXP NFC CLRC66303 + Microcontroller (MCU)

OR

Option 2

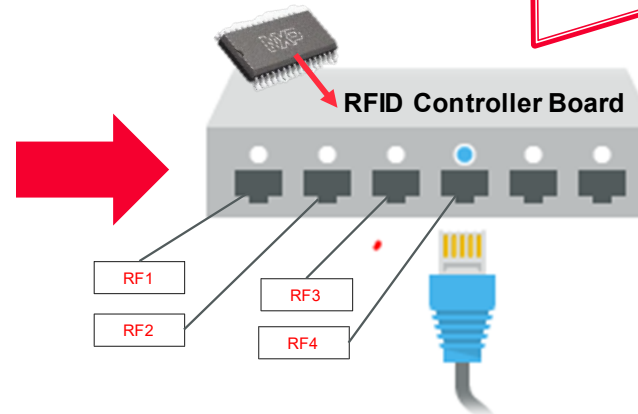
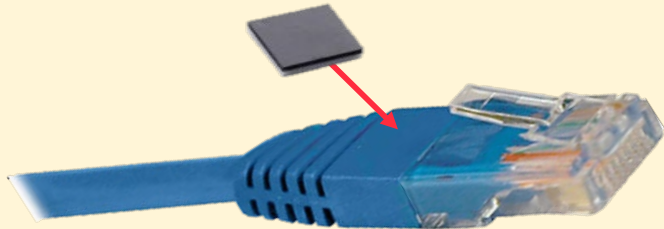
NXP NFC Controller PN7362/PN7360

+9 VDC to
+12 VDC
RS-232



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Murata RFID micro tag



1. Detect by Handheld – R/W

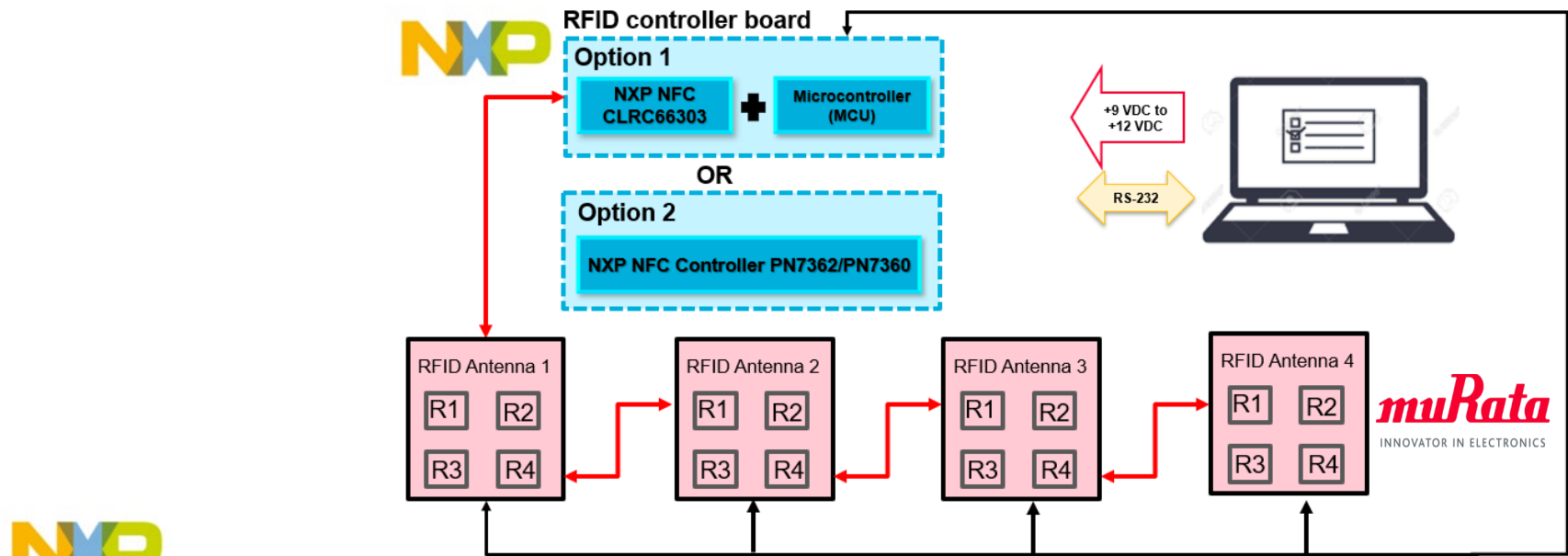
2. Detect by NFC chip R/W & Antenna on board
(Single Antenna & Reader)

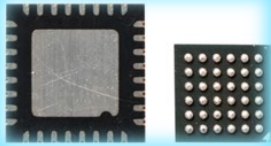
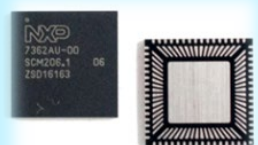
3. Detect by NFC chip R/W & Antenna on board
(Multiple Antennas & Single Reader)

How it works:

1. 1 antenna board is designed with 4 addressable antennas that can detect up to 16 RFID micro tags.
2. Each RFID antenna board needs to be connected to each other.
3. The whole system is controlled by a RFID controller board and there are 2 options available.
4. This system supports various interfaces (RS232, USB, etc.)

NXP NFC Controller



NFC CLRC663 	NFC readers are the active components in NFC transactions. They can read and write cards and tags, interact with NFC phones and enable communication from device to device.	https://www.nxp.com/products/rfid-nfc/nfc-hf/nfc-readers:NFC-READER
PN7362/ PN7360 	The PN736X NFC microcontroller offer a one chip solution to build contactless applications. It is equipped with a highly integrated high-power output NFC-IC for contactless communication at 13.56 MHz enabling EMV-compliance on RF level, without additional external active components.	https://www.nxp.com/products/rfid-nfc/nfc-hf/nfc-readers:NFC-READER



NXP's NFC product – push your design further



Best performance at lowest power consumption

- extended Low Power Card Detection range with new configuration options
- low supply voltage for battery support down to 2.5V



Design flexibility

- max. operating transmitter current of 350mA with limiting value of 500mA
- broad temperature range from -40°C to +105°C



Backward compatibility

- pin-to-pin and software compatible to CLRC663



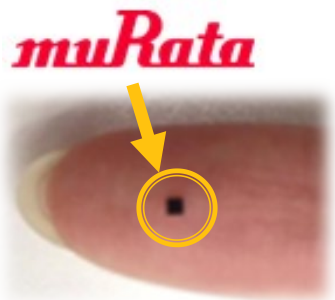
Faster time-to-market

- complete support package: EMVCo compliant NFC SW library, NFC Cockpit with VCOM interface
- easy antenna configuration

Unique values of Murata RFID micro tags

1. Ultra Small Size

Murata's Tag
1.25 x 1.25mm



2. Durable

- Ability to withstand extreme temperatures and high pressure
- Embeddable/ over-moldable



3. Unique Product Designs



- Integrated antenna – NFC & RAIN RFID
- On-metal chip tag for metal surfaces
- Integration of material and design
- Maximum performance for product size

4. Strong Knowledge

- Vast experience in RF technology
- UHF/ HF antenna design
- Materials, evaluation and testing



5. Strong Partnership:

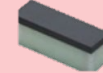
- NXP (market leader)
- Reliable solution



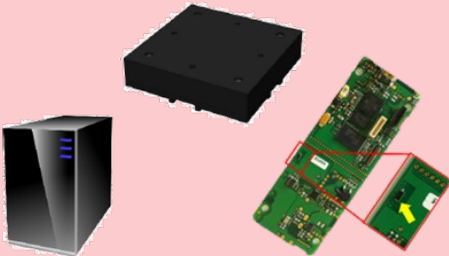
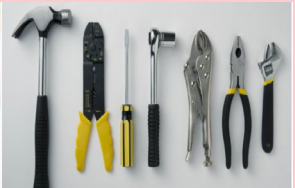
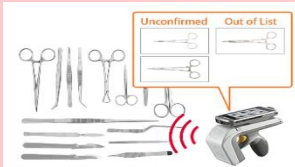
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Product Specifications: Murata UHF/ HF RFID Tags

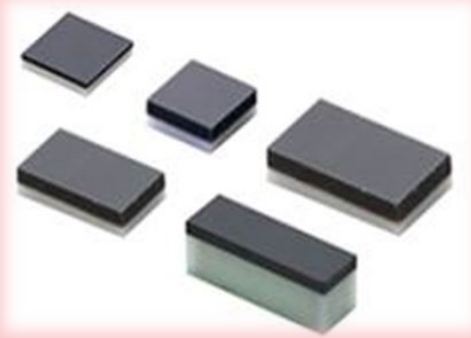
Part Number	UHF					HF	
	Micro Tag		PCB Mount Tag		On Metal Tag	Micro Tag	
	LXMSJZNCMD-217	LXMSJZNCMF-210	LXMS21ACMF-218	LXMS21ACMD-220	LXTBKZMCMG-010	LXMS33HCNG-134	LXMS33HCNK-171
Appearance							
RFID Standard	ISO18000-63 and EPC Global Gen2v2		ISO18000-63 and EPC Global Gen2v2		ISO18000-63 and EPC Global Gen2v2	ISO15693 NFC Forum type5	ISO14443 TypeA NFC forum type2
Frequency	865-928MHz		865-928MHz		865-928MHz	13.56MHz	
IC	Impinj Monza 4QT	Impinj Monza R6	Impinj Monza R6	Impinj Monza 4QT	Impinj Monza R6P	NXP ICODE SLIX	NXP NTAG210
EPC memory	128bit	96bit	96bit	128bit	128/96bit	64bit	64bit
User memory	512bit	NA	NA	512bit	32/64bit	896bit	384bit
Size (L x W x H)	1.2 x 1.2 x 0.55 mm		2.0 x 1.2 x 0.5 mm		6.0 x 2.0 x 2.3 mm (max.)	3.2 x 3.2 x 0.7 mm	3.2 x 3.2 x 0.75 mm
Tag material	Ceramic, RoHS Compliant						
Read range (typ)	More than 10mm (1W reader)		9m(4W EIRP)	7m (4W EIRP)	Tag only 20mm On metal 150cm (4W EIRP)*	20mm (Murata R/W) 5mm (iPhone7)	15mm (Murata R/W) 3mm (iPhone7)
Heat resistance	Up to 85°C		Up to 85°C		▲25°C~85°C	Up to 85°C	

Product Applications: Murata UHF/ HF RFID Tags

Part Number	UHF					HF	
	Micro Tag		PCB Mount Tag		On Metal Tag	Micro Tag	
	LXMSJZNCMD-217	LXMSJZNCMF-210	LXMS21ACMF-218	LXMS21ACMD-220	LXTBKZMCMG-010	LXMS33HCNG-134	LXMS33HCNK-171
Appearance							
Attachment	Adhesive glue or tape		Solder mount on PCB		Adhesive, heat shrink tube, etc.	Adhesive glue or tape	
Application	• Small item tracking • Product authentication • Brand protection • Item identification 		• Product authentication • Inventory control • Logistics tracking • Warranty and returns 		• Surgical tools • Industrial tools • Metal items  	• Small item tracking • Product authentication • Brand protection • Item identification 	

Product Overview: Murata RFID Portfolio



RFID Tags	SOI* Switch	RF Connectors
		
Murata's RFID platform contributes to the realization of IoT, through the provision of hardware, software, and communication interfaces	RF switches are components used for switching the signal paths of high frequency circuits in wireless communication devices	Microwave coaxial connectors transmit radio frequency signal between circuits
https://www.murata.com/en-sg/products/rfid/rfid	https://www.murata.com/en-sg/products/rfswitch	https://www.murata.com/en-sg/products/connector

*SOI: Silicon on insulator



**Don't put your
life on the lines!**

Free up your time to be more productive!

Let Murata RFID tags help to organize, simplify, and add traceability to your cables.



Talk to our expert!



Jacey Ng

Product Engineer, Murata Electronics Singapore
RF Components & Wireless Connectivity Section



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<https://www.linkedin.com/in/jacey-ng>

To learn more on our RFID products: <https://www.murata.com/en-sg/products/rfid/rfid/overview/single>